

## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>20031064 WO</b>	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. <b>PCT/FI2004/000718</b>	International filing date ( <i>day/month/year</i> ) <b>26-11-2004</b>	Priority date ( <i>day/month/year</i> ) <b>27-11-2003</b>
International Patent Classification (IPC) or national classification and IPC See Supplemental Box		
Applicant <b>Outokumpu Technology Oy et al</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a.  (*sent to the applicant and to the International Bureau*) a total of \_\_\_\_\_ sheets, as follows:

sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b.  (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand <b>26-09-2005</b>	Date of completion of this report <b>15-02-2006</b>
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer <b>Ender Dag/MN</b> Telephone No. +46 8 782 25 00

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

International application No. <b>PCT/FI2004/000718</b>
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**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.

Continuation of: **Cover sheet**

**INTERNATIONAL PATENT CLASSIFICATION (IPC) :**

**G05B 13/04 (2006.01)**

**C25C 7/06 (2006.01)**

**G05B 1/06 (2006.01)**

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2004/000718

## Box No. I Basis of the report

1. With regard to the language, this report is based on:

- the international application in the language in which it was filed  
 a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:  
 international search (Rules 12.3(a) and 23.1(b))  
 publication of the international application (Rule 12.4(a))  
 international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- the international application as originally filed/furnished

- the description:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- the claims:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- the drawings:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

- the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/FI2004/000718

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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## 1. Statement

Novelty (N)	Claims	<u>1-20</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	_____	YES
	Claims	<u>1-20</u>	NO
Industrial applicability (IA)	Claims	<u>1-20</u>	YES
	Claims	_____	NO

## 2. Citations and explanations (Rule 70.7)

**The invention**

The applicant describes the problem of controlling the measurement values for the treatment of metals in electrolysis. The parameters to be controlled must be identified in real-time in order to easily identify and improve the influencing values. Therefore, the intention of the applicant is to provide a method to continuously identify and influence parameters by a mathematical model or algorithm for an electrolytic treatment of metals.

**Documents cited in the International Search Report**

D1: WO 03000960 A1

D2: JP 5263299 A

D3: DE 19707981 A1

Document D1 discloses a method for the improvement of the process measurements, e.g. current, temperature, composition of the electrolyte and electric current, in the electrolytic treatment of metals. A theoretical cell voltage is first calculated which is compared with a measured voltage. The difference between the theoretical and measured voltage is monitored constantly, and information on the status of the process can be obtained continually. From this information a user can concentrate to a more critical cell group separately to control and avoid disturbances to a well running group and concentrate only on the groups requiring immediate attention (see page 3, line 9 - page 4, line 28).

Document D2 discloses a power source device for

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**Supplemental Box**

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Continuation of: **BOX V**

electroplating. The power source has a processing section to output estimated values of fuzzy variables and control program to affect fuzzy logic. An inference value and a set value contained in a memory are compared by a control program unit (CPU) and a correction value is calculated. The feedback to add or subtract the correction value to or from the interference value is repetitively executed (see abstract of PAJ).

Document D3 discloses a method for coating a metal strip with the characteristics of the galvanic cell determined by means of a fuzzy logics system. The coating is regulated according to the properties of the galvanic cell in such a way that a layer corresponding to a desired thickness by means of a fuzzy logics system (see abstract).

**Claim 1**

The invention according to claim 1 differs from what is known in D1, which is regarded as the most relevant document, in that collected real-time process and control data is transformed into mathematical model or an algorithm for describing the process index status. This eliminates problems connected to the evaluation of the status of an electrolytic process with the use of mathematical models based on collected history data and empirical data.

The problem to be solved is to transform and adjust the collected data in a process to status index evaluation. This makes it possible for correct point of time and with correct target to be controlled during the process.

To control and evaluate status for collected history data based on mathematical model or algorithm for the performance of a real-time process control is not considered to go beyond what is expected for a skilled man in the art. It is well known and of general technical feature that mathematical model calculates, operates and processes logical arithmetical procedures with the study related to ensure the solution of a problem by specific determinations of status set index value of data information. This solution of status information based on mathematical calculations can be displayed in any form of information to an operator for overview and control over the

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**Supplemental Box**

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Continuation of: **Box V**

process. Therefore, to not explicit express transformation of history data collected from the process into mathematical models or algorithm for presentation of real-time status is not considered going beyond what is expected for a skilled man in the art. Further the skilled man in the art looking for alternative way of computational procedure to ensure the solution of a problem in electroplating processes based on mathematical models or algorithms find such in documents D2-D3.

Hence, the technical feature of using mathematical models or algorithms in a process plant is considered as known technique to a person skilled in the art. Since no unexpected technical effect beyond that expected is achieved, the feature of the invention according to claim 1 is either disclosed in cited documents or is not considered to go beyond what can be expected from a person skilled in the art. Consequently, the subject matter of claim 1 lacks an inventive step.

**Claims 2-20**

The dependent claims 2-20 enumerates further implementation details. Since no unexpected technical effect has been achieved, the invention defined in dependent claim 2-20 must be considered as an obvious application of known art.

The claimed invention is regarded to be industrially applicable.